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in Gynecology.

BY

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ST. LOUIS.



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*With the Compliments
of the Author.*

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ELECTRO-THERAPY AND SURGERY IN GYNECOLOGY.

BY GEORGE J. ENGELMANN, M.D.,
St. Louis.

WITHIN the last two years, since the reading of my first paper on this subject at the Baltimore meeting of this Society the general interest in gynecological electro-therapy has constantly increased, and many have resorted to the use of the current in gynecological practice; but I fear that much disappointment has been experienced, as too much has been claimed by enthusiastic advocates, so that those who hastily endeavored to utilize the new remedy have been more or less disappointed, and now rashly condemn it. But they have failed, not because the agent is an impotent one, but because it is as yet too often applied with imperfect apparatus, and indiscriminately, without a strict knowledge of the conditions under which it might be effectually used. The agent is applied at random, with a vague hope of success, without reference to properly formulated indications, based upon pathological considerations by which the practitioner justifies the administration of other remedies.

For myself, I will say that the new remedy has proven all that we might reasonably expect. I am thoroughly satisfied; although I have not been able to achieve results so brilliant, in all cases of large uterine tumors, as those claimed by Apostoli, by the Keiths, or by my respected colleague, Dr. Baker, this very failure has served me to gain a more

thorough knowledge of the agent ; all such tumors are not fit subjects for this treatment—and I now thoroughly appreciate the cause of my failures—failures to cure, not failures to relieve : failures, if you may so call them, which are due to the structure of the growth in the individual case. In former years, I, myself, have applied the current, as most operators still do, indiscriminately, in such cases of uterine tumor as were either inoperable or refused operation. Thus, I fell into the common error of indiscriminate electro-therapy, and, of course, treated many cases in which reduction was simply impossible. By apparently peculiar variation of failure and success, I was taught to discriminate, and soon saw that this remedy, like all others, must be selected for the individual case.

Hitherto we have been groping in the dark ; the treatment has been applied without indications, other than the convenience of patient or practitioner, to fibroid, myoma, or sarcoma, intramural or subperitoneal, in rapid growth or in cystic degeneration : hence the variety and vagueness of reports, an evidence of the uncertain status of electro-therapy, which must persist until the present wide field of application is defined and limited, and the practitioner proceeds, as with other methods, only after a thorough sifting of the case, and the determination not to resort to the treatment until correct indications can be established. With increased experience and discrimination the record constantly improves, and the good results which I have obtained of late under rather unfavorable circumstances afford most satisfactory evidence of the value of the electric current as a therapeutic agent.

During a long period of painful inactivity, away from home, I have been enabled, by the courtesy of foreign *confrères*, who kindly placed at my disposal suitable cases, to verify many of the results previously obtained ; although with imperfect and hastily collected apparatus I was called upon to treat patients carefully observed by most sceptical

eyes, and frequently patients upon whom other methods had failed, I am well satisfied with the results.

In the present unsettled state of gynecological electro-therapy, I trust that I may be pardoned these brief general observations before entering more directly upon the field which I have outlined for this paper : surgical electro-therapy, or the application of galvanism in cases of a surgical nature. Whilst in gynecological electro-therapy we may utilize faradic, galvanic, and possibly static electricity, I will speak of galvanism only, and of galvanism in cases which must of necessity become surgical unless relieved by this method.

I have confined this paper to the application of electricity in surgical cases, not because the therapeutic results of galvanism, either as a main factor or as an adjuvant in the treatment, are less striking or less desirable, but because I believe that it is well in this era of venturesome antiseptic surgery, with its brilliant achievements, to demonstrate the possibility of attaining similar results by less violent and less dangerous methods. If, for the sake of brevity I speak of surgical electro-therapy, I refer to the application of the treatment in cases of a surgical nature. But let it be well understood that I do not, in all cases, propose the electric current as a substitute for the knife. I am, myself, a strong advocate of surgical gynecology, and yet I would urge the claims of the current most earnestly in a certain class of cases and under certain circumstances. Some cases are peculiarly suitable for this treatment, and can be so rapidly relieved—cured—that the most enthusiastic surgeon will not deny the advantages of so apparently harmless a remedy over the bloody operation ; in other instances in which surgical interference would appear indicated, peculiar circumstances may necessitate a resort to this violent method. If the consent of the patient be refused for surgical interference, if it is impossible for her to have the necessary attention, or if her duties do not admit of confinement, relief should be attempted by the current : operation is out of the question, and electro-therapy must be resorted to.

Nothing is lost by this first resort to electricity in proper cases; even should it result in failure, the suffering of the patient will be allayed, her general condition improved, and surgery invariably remains with the prospects for a successful operation improved. The surgeon, as a rule, will yield most unwillingly to electro-therapy, as the *eclat* of an operation is lost: no anæsthesia is given; neither nurses nor assistants are summoned; a tumor reduced, or checked in growth, the functions restored, a dysmenorrhea, or even an hæmatocele, or pelvic infiltration cured by so simple a method as the holding of the electrodes for a few minutes, with scarce any inconvenience to the patient, brings but little glory to the surgeon. In his office, without much display, he will often accomplish results as striking as those hitherto attained by more effective surgical procedures. It is a simple, modest proceeding, with frequently striking results: the patient may often be treated in the office as she would for a simple endocervicitis, or some minor displacement; life is not endangered, and yet the success, perhaps more slow, is, in proper cases, as certain as it is to the surgeon.

RELATIVE MERITS OF SURGICAL AND ELECTRICAL TREATMENT IN CASES ADMITTING OF COMPARISON.

A. Advantages of electro-therapy.

First. Safety of the method is in its favor with physicians and laymen: danger even in cases of deep puncture may almost be precluded, and with proper antisepsis and correct methods no serious consequences of any kind are to be dreaded. The necessary precautions are, moreover, so simple that they may be observed by every careful practitioner; whilst the dangers of surgery vary greatly with the experience of the operator.

Second. The patient is not confined to bed; the continued well-being of the patient, who is usually able to continue her daily vocation, is important to many; rarely after a first application is she confined to bed, and then as a precautionary

measure ; hence, this is often the only possible method of treatment to which the working woman is willing or able to submit.

Third. Its compatibility with all other methods of treatment ; and that in case of failure but little is lost, as the patient will at least be in a more satisfactory condition for surgical treatment.

Fourth. Sometimes there is an advantage in this proceeding, in the avoidance of that nervous excitement so frequently caused by the thought of a surgical operation.

B. The pathological conditions which admit of treatment by galvanism, and in which I would advocate the resort to electrotherapy, with reliance upon surgery in case of failure, are in the main : (I.) *Inflammatory products* which admit of restitution, and (II.) such *Neoplasms* as offer probabilities of healthy retrograde metamorphosis.

However broad this statement, it is a foundation upon which the indications for the treatment may be based ; the crude outline of the map, as was so well stated by my venerable friend, Dr. Grailey Hewitt, into which the details will be marked by progressive observers. As has already been stated, the cases favorable for this treatment are those in which it is possible to obtain restitution by a process of retrograde metamorphosis ; those in which the electrolytic action of the current or the direct chemical effect of the pole may be utilized : indurations, inflammatory deposits, the results of interstitial inflammation, and certain neoplasms, deep-seated tumors which admit of healthy retrograde metamorphosis, and superficial growths which can be subjected to the direct chemical action of the pole. Such are the results of inflammation of the uterine and circumuterine tissues, induration and enlargement of the uterus by chronic metritis, stricture, stenosis, deposits in the cellular tissue, para- and peri-metritis, fibroids, and myomata, especially intramural and submucous, before they have entered upon the process of disintegration ; polypi, caruncles, and hemorrhoids ; whilst the necessity for the removal of the tubes and ovaries may in some cases be avoided

by the proper use of the electric current, I will not compare the results of electro-therapy in such cases with the results of operative interference, as the proper indications for both vary so much with each individual case; I will only say to those who advocate oöphorectomy for nervous disturbance with but slight pathological changes in the part, that a trial at least be given this treatment before resorting to operative procedures. Of extra-uterine pregnancy, I will likewise say but little, as I believe that surgical and electrical treatment each have their distinct indications, not, as in other cases, admitting of a choice in accordance with surrounding circumstances.

Before entering upon the consideration of individual cases, I will repeat, as I do not desire to be misunderstood, that I do not unqualifiedly urge electro-therapy in the class of cases now under discussion, as a substitute for surgical interference, but as a method to be held in view as feasible and proper to be resorted to under special circumstances, if the condition of the patient or her surroundings should make the method preferable. We shall soon be better able to formulate our indications; for the present we can say only that if the above pathological conditions exist, we may resort to electro-therapy with good hopes of success.

I. CHRONIC INFLAMMATORY CONDITIONS.

These are :

a. In the uterine tissues:

1. Stenosis, stricture, cicatricial contraction of the uterine canal;
2. Several forms of endometritis, interstitial and fungous; and
3. The enlarged, indurated uterus, produced by chronic metritis.

b. The results of inflammatory conditions in the circum-uterine tissues.

1. Suppurative forms of perimetritis;
2. The solid exudates.

a. Inflammatory Products in the Uterine Tissues.

1. *Stenosis and stricture by induration of the walls and cicatricial contraction of the canal.*—The surgical treatment of these cases, and that with which I would here contrast electro-therapy, is dilatation, rapid and slow, and excision, and, in the majority of cases, I give decided preference to the simple, harmless, and in this instance more rapid method of treatment by the galvanic current, especially if they be accompanied by induration of the uterine tissue; the treatment is less painful than even that of gradual dilatation; it is as rapid as that of excision, and preferable in every way to the brutal method of rapid dilatation, unless undertaken for the object of producing an abnormally wide canal preparatory to the introduction of other instruments for operative purposes. Extreme cases of cicatricial narrowing, in which it would be impossible to insert even the most slender dilator, can be overcome readily and rapidly by this method without pain or anæsthesia. But it is only for the purpose of establishing normal apertures to afford the necessary exit for retained fluids and to relieve the pains of a dysmenorrhœa. Actual dilatation of the uterine canal beyond its natural limits for the purpose of examination or operation, the introduction of finger or instruments, must be accomplished by the knife or the dilator. By the method proposed the stenosis or cicatricial contraction is overcome, first, by the direct destruction of the cicatrized or indurated tissues, by the cauterizing action of the conical metallic pole; and, secondly, by the absorption of the indurated tissues in the surrounding uterine walls, which is effected by the electrolytic action of the current.

The advantages of the method are that it can be practised in the consulting room; that no anæsthesia is necessary; that the tissues which cause the narrowing are destroyed, the surrounding induration eliminated, and a healthy condition of the tissues approximated, so that a return of the narrowing is not to be feared, as it is after incision and certainly after moderate dilatation.

The effect upon the uterine nerves is of the greatest importance, and I believe that the relief of the dysmenorrhœal pains, which is so easily attained by treatment of strictures by electro-cauterization, is due to this very fact, and not alone to the mechanical widening of the canal.

A most striking case of the kind I have cited in my first paper on gynecological electro-therapy, in which the external os and lower portion of the cervical canal had been so narrowed by cicatricial contraction, the result of a nitrate of silver treatment, that only the most delicate surgical probe could be introduced, hence a dilator was out of the question. The first electrode inserted was a simple sewing needle, and by a gradual increase in the size of the instrument, I was enabled within a little over five minutes to introduce a small sized uterine sound. A single treatment sufficed to relieve the symptoms, and a return of the condition is not to be dreaded. This was a case seen by many in my own clinic, but as the presence of critical observers adds to the value of the cases reported, I will also mention a case treated by myself before the Berlin Gynecological Society in June last, for the purpose of demonstrating the truth of the facts claimed in my paper previously read before that society. The patient was one kindly sent to me from the clinic of Dr. Martin, who had been consulted on account of the intense pain which she suffered with each monthly return of her sickness. By the use of great force he had succeeded in passing a sound, but immediately upon its withdrawal the previous condition returned. The patient was brought before the Society, and with an electrode prepared for the purpose, I succeeded, within less than six minutes, in widening the canal sufficiently to admit of the passage of an ordinary sound; a current of 120 milliamperes was used, with a medium sized electrode upon the abdomen. No undue pain was caused, and the next menstrual period, some five days later, passed without the previous suffering. A number of applications were made after this time for the purpose of widening the canal still

more, so as to allow a large sound to pass easily, although I do not believe it would have been necessary permanently to secure the result obtained by the first treatment.

2. *Endometritis, with induration or polypoid development of the mucous membrane, interstitial and fungous endometritis.*—Cases of this kind, in which a speedy result can be obtained by surgical interference only, by the curette, can be relieved almost as rapidly by electro-cauterization with a metallic electrode as large as can be introduced, and currents of from 100 to 150 milliampères; the negative pole being used in more common forms of endometritis with induration, by which not alone the superficial layers of the diseased mucosa are destroyed, but an absorption is inaugurated in the surrounding tissues; the positive pole serving in the polypoid forms for the purpose of first overcoming the hemorrhage which usually coexists.

This method is a most happy alternative in the outdoor departments, and for the treatment of patients who have the care of their homes and cannot be confined to bed, even for a few days. Under the most unfavorable circumstances, it is at least more satisfactory than any therapeutic measures which can be adopted, and should it fail, the curette can always be resorted to.

3. *Chronic metritis, hyperplasia uteri*, usually accompanied by endometritis and a certain amount of perimetritis, and uterine displacement, descensus of the enlarged uterus. These are cases which frequently resist even prolonged treatment, and which are successfully attacked, especially by German surgeons, by the so-called amputation of the cervix, the wedge-shaped excision; and in this country, if accompanied by laceration, by Emmet's operation; the most important result of this procedure being the retrograde metamorphosis, the absorption inaugurated by the surgical interference. A similar result can be attained by the electrical treatment, by electro-puncture, the use of a strong needle as negative pole, which is passed into the indurated tissues; if

the endometritis is a leading feature, the electro-cauterization is first resorted to. In either case, currents of about 100 milliampères should be used. The process of absorption once inaugurated, faradism, with coils of low tension as a uterine massage will complete the cure.

b. Products of Inflammation in the Circumuterine Tissues.

We may compare the results of electrotherapy with surgery in two forms of this affection: the suppurative, and the solid exudate.

1. *Suppurative perimetritis.*—Suitable for this treatment are only such of the chronic forms of this affection which are accessible per vaginam and best so evacuated; this is merely a variation of the usual surgical procedure; the knife, the scissors, or dilators are replaced by the metallic electrode with the negative pole. I look upon the vagina as the most natural and satisfactory outlet for pelvic abscess originating in the circumuterine tissue, and I am entirely in accord with the methods now generally followed—for instance, that adopted by Goodell; but instead of entering with the blunt scissors or the steel dilator, I resort to a negative electro-puncture—that is, I penetrate into the sac with a metallic electrode in connection with the negative pole of the battery, or endeavor to follow the fistulous tract if this be found. An open pathway is thus established without hemorrhage, without the production of a raw, absorbing surface, and if an electrode of a sufficient size is used, there is no danger of contraction as in an opening produced by other methods. The trocar with the canula or even the dilator may be connected with the battery and used as a perforating electrode. Recent cases are best treated by free incision, with washing and drainage; but for old cases which have persisted for a length of time, with thickening of the walls and surrounding tissues, the opening by electro-puncture possesses the following advantages:

First. These cases are often difficult to diagnose; the infil-

tration is evident, but the presence of pus doubtful; the abscess walls are thick and hard, and the circumuterine tissues infiltrated so that fluctuation cannot be detected. Under these circumstances electro-puncture per vaginam, with currents from 100 to 200 milliampères, is the correct diagnostic and therapeutic measure. If pus is found, the outlet is established. If suppuration does not exist, that fact has been positively determined and at the same time the most active measure at our command to overcome this most annoying condition has been resorted to, and the treatment must be continued.

Second. It is a safe method of dilatation. The extent of its action is fully under our control; raw surfaces are not produced, and vessels which by chance are opened are not liable to bleed, as they are closed by the accompanying cauterization, and besides, they are mostly in the softer tissue, and pressed aside.

Third. I advocate this method in chronic cases of long standing, which are invariably accompanied by induration of the surrounding tissues, and the same method by which the outlet is established serves most effectively to hasten the absorption of the inflammatory products. Whilst I deem the knife preferable in recent cases of suppurative perimetritis or pelvic abscess, and in those which can be treated by laparotomy only (salpingitis with its sequences), the opening by electro-cauterization has undoubted advantages in chronic forms accompanied by induration which can be evacuated per vaginam. The method is precisely the same as that now in general use: free evacuation, drainage, and antiseptic washing; the knife, the blunt scissors, or the dilator being replaced by the negative pole of the battery. It is, perhaps, immaterial in what way the pus is evacuated if free discharge is obtained, but electro-therapy is the only method upon which we can rely to accomplish absorption after evacuation. The advantages of this treatment become more apparent as the induration increases.

2. *The solid exudates.*—Recent deposits are frequently absorbed under careful treatment, and even without treatment; but I refer to such solid, pelvic exudates which have persisted for months and years, resisting all treatment; cases which are most perplexing, in which even surgery fails to afford relief. The usual remedies are the poultice, the hot douche, and iodine, perhaps massage, pressure, and rest. These are treated most effectively, like the pelvic abscess with induration of tissue, by electro-puncture, and yield even to vagino-abdominal galvanism—that is, the galvanic current without penetration of tissue by the electrodes. I have already reported several such cases, in which solid exudates which had existed from five to twelve years, and in which all possible treatment had been tried, even by eminent gynecologists, disappeared after from twelve to twenty office treatments by vagino-abdominal galvanism, with currents not exceeding 100 milliampères. I can give no better illustration of the merits of this treatment than by the report of a case in the wards of the Berlin Lying-in Hospital, and placed at my disposal by Professor Olshausen as a test case, the patient having been in the gynecological ward for more than a month, under the hot water treatment, with but little benefit. The patient had for years been affected with prolapsus uteri, and some three or four months previous had contracted a pelvic cellulitis, as the result of which a solid mass now filled the entire left half of the pelvis, extending well into the right, so much so as to prevent the return of the prolapsed uterus. The fever had ceased, but the pains were more or less constant and aggravated by every step. The uterus being prolapsed, it was impossible to insert the electrode into the vagina, so I employed the cotton-wrapped applicator as the negative pole in the uterine cavity, placing the large positive plate over the abdominal surface of the mass. One week after the second application of 80 or 90 milliampères I was enabled to replace the uterus; the pains had subsided, the patient was perfectly comfortable and able to walk; whilst

only in the smaller right exudate a decided reduction was noticeable, the easy replacement of the uterus afforded ample evidence of the absorption which had taken place. I myself made but two or three more applications, but the treatment was continued by the gentlemen who had so kindly interested themselves in the trial.

Much as I claim for electro-therapy, I am not willing to compare its results with those of Tait's operation, as has been done by some, although the tubes and ovaries are unquestionably removed in certain forms of perimetritis which might be successfully treated by galvanism. These are cases in which the organs are removed for the suffering caused by chronic inflammatory conditions, with induration, not suppuration; but whilst enthusiastic operators do not spare these cases, I hardly believe them fit subjects for surgical interference until all other means have failed. In course of time the indications will be so strictly formulated that each treatment will be relegated to its proper sphere.

Hæmatocele. In recent cases the opening by the knife may well be replaced by electro-puncture, but in cases of long standing the electrical treatment is undoubtedly the most safe and rapid. The retro-uterine hæmatocele, like the solid exudate in consequence of pelvic cellulitis, yields readily to the galvanic current. I have myself seen these cases disappear under this treatment, and believe that not a few fibroid tumors reported in recent literature as cured by electro-therapy were of this nature. The opening of recent cases by electro-puncture to afford an outlet to the fluid is more safe than the surgical operation to any but the experienced operator, and in chronic cases the treatment by the current alone, by the vagino-abdominal application, without puncture, is free from any possibility of danger, without pain to the patient, and certain of result, even with currents of moderate intensity, from 40 to 80 milliampères. Thus in a case reported to me from the clinic of Dr. Martin, this method was tested. The patient, who had been treated without marked advantage in the wards

of one of the gynecological hospitals, constantly in bed, was rapidly improved by the electrical treatment, in the outdoor department, without puncture, by the simple vagino-abdominal application.

II. NEOPLASMS.

a. The electrolytic action of the current.—Notwithstanding the remarkable results achieved by antiseptic surgery, the dangers of laparotomy, for the removal of uterine tumors are still such that we must give preference to any less dangerous method, by which the patient may be relieved, and prominent among these is the electrical current: an admirable remedy in certain forms of neoplasm, but by no means applicable to all. Only certain forms of neoplasms, and neoplasms in certain stages of development or retrograde metamorphosis are amenable to treatment by the electrical current; whilst in all, the sufferings of the patient may be relieved and her general condition improved, the growth itself can be reduced in some only. Certain of these growths may be treated successfully by electro-therapy, others can be removed by the knife only, and the course to be pursued depends upon the existing pathological conditions: hence it is important that we carefully discriminate between the different forms of neoplasm in order to decide upon the relative merits of the various modes of treatment.

Dr. Martin, of Berlin, in a paper read before the last meeting of the German Gynecological Society, at Halle, in June, 1888, throws a great deal of light upon this subject. In analyzing the cases operated upon by himself he points out the large number which were found in various states of retrograde metamorphosis. Some of these forms lead to absorption, others to a vicious degeneration, and electrolysis hastens such processes when once inaugurated: hence the excellent results of electro-therapy in tumors of a healthy growth, or those in which fatty degeneration has begun. This process with the following absorption is inaugurated or hastened by the electrical

current, and it is evident that under such circumstances we may expect a reduction of the growth. But it is equally clear that those tumors which have already entered upon one of the many processes of metamorphosis which lead to degeneration cannot be revolutionized; on the contrary, as has been my experience, this form of degeneration, be it cystic, suppurative, or malignant, will be hastened, but whilst the symptoms are temporarily improved, a reduction of the tumor is impossible. An active circulation, with a healthy condition of the patient, is likewise more favorable to healthy retrograde metamorphosis and absorption. Some of the most striking, although by no means the most important, results of surgical electro-therapy have been gained in the treatment of uterine tumors. It is, indeed, a victory for so harmless a method of treatment that a large growth which threatens life is reduced, and rendered harmless by so mild a form of treatment. The analysis of the pathological conditions in cases actually operated upon as furnished by Dr. Martin, enables us to differentiate with some accuracy, and affords a probable explanation for failure or success in certain cases: it is not the inefficiency of the remedy, not necessarily the inexperience of the operator, but the character of the growth. We cannot expect, by electrolysis, to reduce a uterine tumor in cystic, suppurative, or sarcomatous degeneration; whilst in a tumor in healthy growth, or one in which the development has already ceased, a healthy process of retrograde metamorphosis may readily be inaugurated. The advantages of this treatment over the operation, even in cases in which the diagnosis is not fully established, are numerous. First, life is not endangered. Second, it may be resorted to by every practitioner with more or less probability of success. Third, even should the tumor not be permanently reduced, the symptoms will be relieved and a comparatively healthy condition approximated. Whilst in certain cases, if urgent symptoms, especially septic infection, exist, there can be no question of the propriety of an immediate operation, in general we can well endorse the

statement of the eminent surgeon, Keith, that he who resorts to the knife for the removal of solid uterine tumors, without having first thoroughly tested the effect of electrolysis, is criminally guilty.

The methods of treatment vary greatly: our first effort is always to relieve the most aggravating symptom, hemorrhage, by the use of the positive pole within the uterine cavity; or amenorrhœa, or painful and scanty menstruation, by increasing the flow by the use of the negative pole; relieving pressure upon the rectum and bladder by the absorption of adhesions which bind down the tumor, or the contraction of the tumor by faradism or weak, interrupted galvanic currents. If the tumor is soft, and consists of muscular fibre, more likely a myoma, interrupted currents will serve to contract more rapidly; if solid and hard, of a fibroid nature, a powerful electrolytic effect must be attempted. Hence the method of treatment, as the probable result, varies greatly with the character of the growth, and our failures hitherto are in part due to the indiscriminate application of the various methods of treatment to all kinds of tumors. In cases in which operation is out of the question by reason of malignancy or an unfavorable local condition, or if the consent of the patient is refused to operation, we should resort to electrotherapy for the purpose of relieving pain and discomfort, and restoring healthy functional activity of bladder, bowels, and stomach. At present, by reason of the danger connected with operative interference, patients so affected are usually brought to the surgeon in a later stage of the disease, when they are forced to seek advice by reason of the great discomfort experienced; but when the possibility of a successful treatment, which is free from danger, is more generally known to the laity and profession, these patients will seek advice at a period when a successful electrical treatment is by far more probable: in the early stages before a vicious retrograde metamorphosis has been inaugurated. Whilst the surgeon may hesitate to interfere before the tumor has attained such a size as to cause

inconvenience and suffering, he is not alone thoroughly justified in resorting to electro-therapy in the earliest stages, but it is even his duty to do so, and I believe that under these circumstances the most successful results will be accomplished.

b. The destructive action of the pole direct.—Smaller growths are, with the present antiseptic methods, so easily removed by the knife, that little attention is given to other methods, and yet the advantages possessed by the electrical treatment are such as to merit consideration. The surgical operation must be performed at the home of the patient. The electrical treatment, as a rule, can be carried on in the consulting-room or the outdoor department of the clinic, and most patients prefer such procedure to a cutting operation. In all small growths we utilize the chemical action of the pole direct. Small submucous fibroids, uterine polypi, urethral caruncles, and hemorrhoids are readily and safely treated by this method, which must not be compared to their removal by the galvano-cautery or thermo-cautery, as we have in the metallic pole of the galvanic battery a chemical cauterization, and if the negative pole be used, an electrolytic action upon the surrounding tissue, which is far more efficient toward accomplishing a permanent cure than the mere local destruction which is caused by the cautery, provided that the structure is one which admits of a retrograde metamorphosis.

Extra-uterine pregnancy. The results of laparotomy have improved so much within the last year or two that we must limit the application of electricity to suitable cases only: it should no longer be a question which is the preferable treatment for extra-uterine foetation, laparotomy or electricity, but what are the conditions which indicate the one and what the conditions which indicate the other? There is no doubt as to the propriety of surgical interference: first, if hemorrhage or rupture of the sac has occurred; second, if urgent symptoms are present; and third, under all circumstances in the later stages.

In the first two, possibly three, months destruction of the ovum by the electrical current is generally the preferable

course, as death will then be followed by absorption without further untoward symptoms. Unfortunately, the condition is rarely discovered at this period ; but if so, it is, as a rule, observed by the general practitioner, who would be unwilling to resort to laparotomy, but who may with the utmost safety test the effect of the galvanic current. The great advantages of electro-therapy in the treatment of extra-uterine pregnancy are evident, most especially so because its field is limited to the early months when the diagnosis is doubtful and the patient is usually in the hands of the family practitioner, perhaps far removed from the experienced operator.

First. At this period, when electricity can be successfully applied, the diagnosis is, as a rule, so doubtful that even the skilled surgeon would be unwilling to resort to laparotomy. There is no danger in the guarded use of the current, and even if the diagnosis is doubtful, it should be applied by the general practitioner at once, as the absorbent action of galvanism is indicated whatever the nature of the tumefaction may be.

Second. As its use is free from danger, it can be applied at the earliest possible moment as soon as a suspicion of the condition exists.

Third. It can be applied with safety by the practitioner in charge of the case.

Fourth. Should the tumefaction not disappear, other measures can still be taken at the proper time.

I believe it to be a valuable remedy, although with a limited field, but extremely important as admitting of an active interference at an early stage, when the diagnosis must of necessity be doubtful, and no one would venture to resort to the dangerous alternative of laparotomy.

Let it be understood that I do not deem it right to compare electricity with laparotomy in the treatment of extra-uterine foetation ; the former is indicated in the early months, when death of the embryo is likely to result in absorption, and should be resorted to as soon as the condition is suspected, whilst laparotomy is in place when absorption is no longer

possible, or when threatening symptoms demand immediate relief.

RÉSUMÉ.—The electrical current is a potent factor in the treatment of surgical lesions, under certain conditions, which must be defined with precision if it is to be classed amongst the accepted scientific methods; this has never been done, and in consequence of the haphazard application this really valuable remedy is ignored, if not condemned, by many. In this paper I have endeavored to formulate such indications founded upon the principles which have guided my own practice, and to demonstrate the application of the remedy in surgical cases; the class of surgical cases in which we may substitute galvanism for the knife are those in which the electrolytic or chemical action of the current may be utilized, neoplasms or inflammatory products in which a retrograde metamorphosis and absorption can be inaugurated.

